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**Chromosomes of *Vicia*.**—SAKAMURA<sup>22</sup> has found in the nuclei of the root tip of *Vicia Faba* during metaphase 12 already split chromosomes, 2 of which are considerably larger ("M-Chromosomen") and constantly showing middle and end constrictions ("m und e-Einschnürung"). In heterotypic mitosis these same constrictions are present in the one large bivalent ("M-Geminus"), which is believed to be composed of the two M-chromosomes. The fibers are attached at the end of the short chromosomes; but to the M-chromosomes and M-bivalent they are fastened at the middle, causing them to assume a v-shape when traveling to the poles. As a result, there are evident 14 arms in somatic anaphase, this feature probably being the cause of the 14-chromosome count; while in heterotypic mitosis, due to the splitting of each of the daughter chromosomes, there are 5 v's and one double v. The chief theory accounting for the origin of the "Einschnürung" is that the M-chromosomes at first are without constrictions, and then under certain conditions constrictions arise. This mechanism is shown to be due to an uneven separation of the chromosomes and to the strain of the fibers above this point, causing a stretching of the chromatin, so that when they do dissociate completely there is this apparent constriction. Before the m and e-constrictions could become hereditary characters they must first have occurred in heterotypic anaphase. While the investigation strengthens the individuality theory of the chromosomes, it throws little light upon the cause of the closely related species and varieties, two points that the author has attempted to prove.—MILDRED NOTHNAGEL.

**Vegetative vigor and reproduction.**—PIETERS<sup>23</sup> has made an interesting contribution to our knowledge of the structural responses of plants to varying chemical and physical conditions. The work of KLEBS, indicating that the appearance of reproductive cells is a response to diminishing vegetative activity, and that structures in general represent expressions of the potentialities of an organism, called out by the prevailing conditions for metabolism, has set in train investigations which should be multiplied. PIETERS used two species of *Saprolegnia* and two of *Achlya* in his investigations, and a summary of his results is as follows. There is no necessary relation between vegetative growth and sexual reproduction when the available food exceeds the minimum concentration necessary for the species. This minimum concentration of food necessary varies with the species, but in general is in the neighborhood of 0.1 per cent peptone for the production of both sporangia and oogonia. While growing vegetatively, a mycelium may develop tendencies that may affect the number and character of the reproductive organs produced subsequently under different conditions. Of the carbohydrates used, maltose and levulose are especially useful for vegetative growth, and the latter is particularly effect-

<sup>22</sup> SAKAMURA, TETSU, Über die Einschnürung der Chromosomen bei *Vicia Faba* L. Bot. Mag. (Tokyo) 29:287-300. pl. 13. figs. 12. 1915.

<sup>23</sup> PIETERS, A. J., The relation between vegetative vigor and reproduction in some Saprolegniaceae. Amer. Jour. Bot. 2:529-576. 1915.

ive in the production of oogonia. Sucrose is probably not used by species of *Saprolegnia* or *Achlya*. Phosphates in the culture solution tend to increase the reproductive capacity of the fungus.—J. M. C.

**Life forms of New York vegetation.**—RAUNKIAER has devised a method of classifying plants according to the way in which they pass the unfavorable season of the year, and by means of a numerical arrangement of these forms, known as a "biological spectrum," the flora of one region may be compared with that of the world as a whole. This journal has commented favorably upon these methods,<sup>24</sup> but they have been neglected by American workers as a whole. It is therefore pleasing to see them applied by TAYLOR<sup>25</sup> to the flora of New York. From the very nature of such investigations, the results will be more significant and valuable as a larger number of similar studies are made. Compared with the normal spectrum, the New York flora is higher in percentages of aquatics, geophytes, and hemicryptophytes, and somewhat lower in percentages of chamaephytes and phanerophytes. No other area to which this method of analysis has been applied has shown such an abundance of deep-rooted perennials of the bulb and rootstock type, here termed geophytes. This is to be correlated with and is partly explained by the large proportion of monocotyledons in the portion of the pine barrens included in the area studied. TAYLOR points out that were it possible to base the spectra upon a census of individuals rather than one of species, different and probably more significant comparisons would result.—GEO. D. FULLER.

**Disease resistance.**—JONES and GILMAN<sup>26</sup> have published a very suggestive bulletin upon the control of the cabbage disease known as "yellows," caused by the soil fungus *Fusarium conglutinans*. It seems that on badly infected or cabbage-sick soil the loss ordinarily ranges from 50 to 95 per cent. Experimental work through five summers seems to justify the conclusion that no method of soil, seed, or crop treatment offers any hope for the control of the disease. On the other hand, the development of disease-resistant varieties by selection has given such promising results that "full reliance can be placed in it as a feasible method for the practical control of this malady." Control of various commercial varieties of cabbage showed that there are marked differences in susceptibility among them, and advantage is taken of this fact to discover a *Fusarium*-resistant strain. The method employed has been based on the observation that even in the worst diseased fields in the autumn there are occasional sound heads, and these have been selected for pedigree culture.

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<sup>24</sup> BOT. GAZ. 44:393. 1907; 51:309-310. 1911.

<sup>25</sup> TAYLOR, NORMAN, The growth forms of the flora of New York and vicinity. Amer. Jour. Bot. 2:23-31. 1915.

<sup>26</sup> JONES, L. R., and GILMAN, J. C., The control of cabbage yellows through disease resistance. Agric. Exp. Sta. Univ. Wisconsin Bull. 38. pp. 70. figs. 23. 1915.